

Environmental Assessment
for the
Proposed Expansion of the
Children's Outdoor Facility
at Keahuolu, Kona

Prepared for
Liliuokalani Trust
Honolulu, Hawaii

Prepared by
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TABLE OF CONTENTS

	<u>Page</u>
I. INTRODUCTION	1
II. APPLICANT	3
III. PROJECT LOCATION	3
IV. DESCRIPTION OF PROPOSED ACTION	3
Proposed Action	3
Statement of Objective	7
V. DESCRIPTION OF THE SITE AND ITS NATURAL ENVIRONMENT	9
Existing Land Use	9
Physiography/Soils	11
Natural Hazards	12
Flora	12
Fauna	13
Climate	13
VI. TECHNICAL/LEGAL	13
Government Policies	13
Zoning	13
Special Management Area	16
Historic Sites	16
Construction of Proposed Action	16
VII. SOCIO-ECONOMIC	21
Population and Settlement	21
Employment	22
Public Roads	24
Utilities	25
Other Public Facilities	25
VIII. SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATING MEASURES	26
IX. APPENDIX	29

LIST OF FIGURES

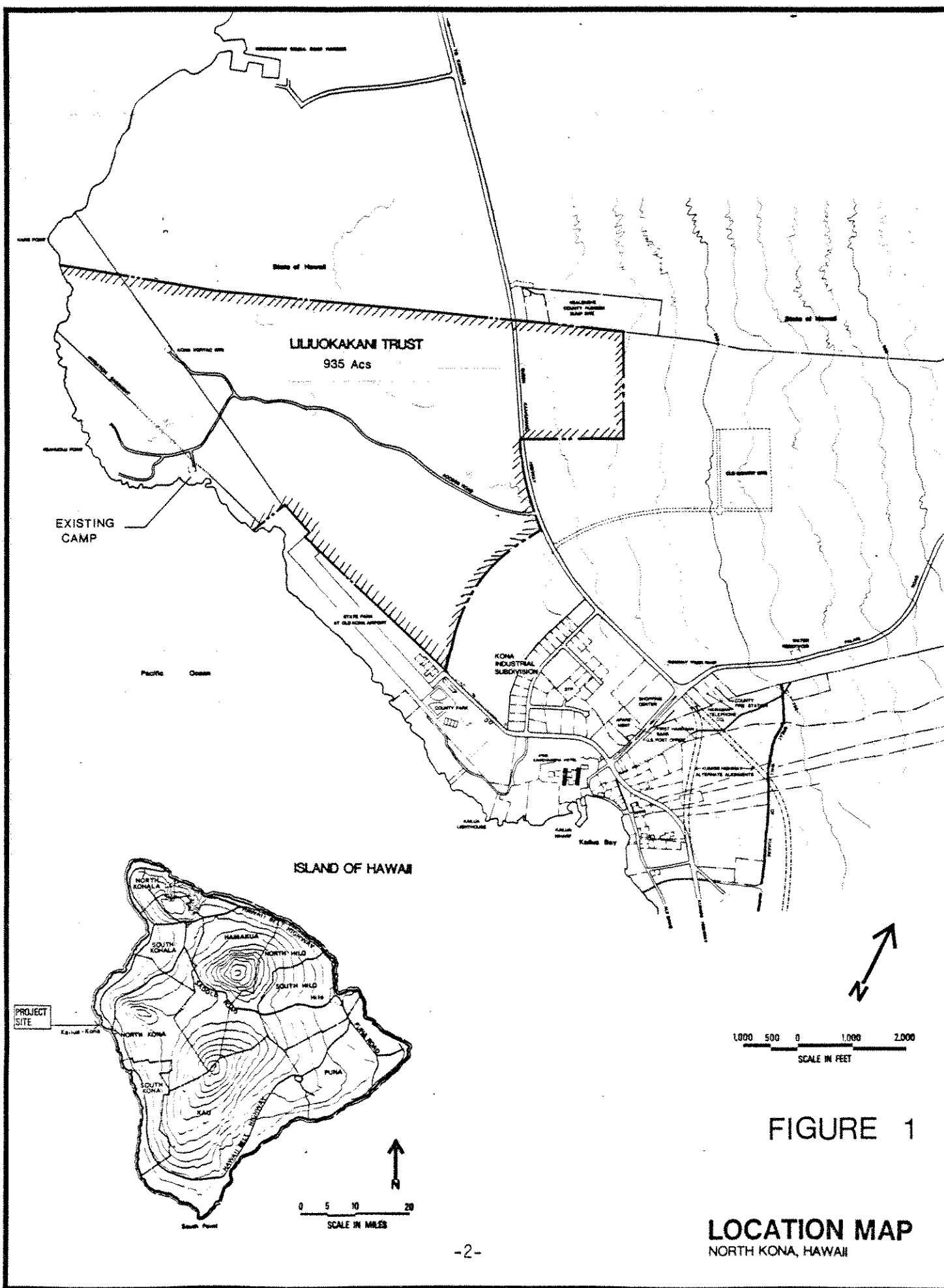
	<u>Page</u>
1. Location Map	2
2. Development Plan	5
3. Existing Land Use	10
4. County General Plan and Zoning	14
5. State Land Use	17
6. Special Management Area	18
7. Historic Sites	19

INTRODUCTION

This Environmental Assessment has been prepared as supplementary material for a Conservation District Use permit application which is being submitted to the Department of Land and Natural Resources, State of Hawaii, by the Liliuokalani Trust for the proposed expansion of its children's outdoor facility at Keahuolu, Kona.

The purpose of this document is to disclose information on the proposed use and its environmental setting for assessment of possible significant effects on the environment and for determination by the Department of the need for an Environmental Impact Statement.

It is the intent of the applicant to provide mitigating measures, if possible, wherever significant effects on the environment will likely occur as a result of the proposed use. This is to assure all the concerns that efforts are being taken to protect the environment.



APPLICANT

Liliuokalani Trust, created in 1903 and amended in 1909 by the late Queen Liliuokalani, is filing this application as property owner and developer through its agent the Queen Liliuokalani Children's Center (QLCC). The Trust was established to provide benefits to orphans and other destitute children in the state with preference to children of Hawaiian ancestry.

PROJECT LOCATION

The project site is located approximately one-half mile northwest of Kailua Village in Kona and is identified as Tax Map Key, Third Division 7-4-08:8,9, por. 2 and 12 (see Figure 1). The property sits immediately mauka of the abandoned Kona Airport and behind 8,000 feet of rocky shoreline. Access to the 935-acre site is via Queen Kaahumanu Highway which also traverses the mauka portion of the project site. The project area located above the highway comprises approximately 55 acres. Honokohau Small Boat Harbor is approximately one mile to the northwest and the Kealekehe County Dump Site is located along the north side of the property above the highway.

DESCRIPTION OF PROPOSED ACTION

Proposed Action

The proposed expansion of the children's outdoor facility at Keahuolu may be classified into three major groups.

- 1) Campsite improvement at Pawai.
- 2) Construction of thatched-roof classrooms and playground.
- 3) Development of an agricultural project.

These improvements are part of a well-rounded cultural, recreational and educational program which the Liliuokalani Trust through its Children's Center is developing on the Island of Hawaii for its beneficiaries in the State. Another facility, similar in nature, has been built at Punaluu on the Island of Oahu and is regarded by the Trust to be successful. The entire Keahuolu project is expected to take five years to complete and involve a development cost of approximately \$400,000, exclusive of planning and design fees.

The existing Keahuolu facility that includes a campground, two comfort stations, shower facilities and an access road and waterline that connect to the highway, is situated in the shoreline area known as Pawai (see Figure 3). Only two acres of the 935 acres are being used for the campsite; the remaining area is vacant and undeveloped except for a 0.17 acre parcel which is occupied by a VORTAC station.

Proposed for the existing campground at Pawai is a general improvement and maintenance program that would allow the beneficiaries of the Trust additional usage of the campsite and permit the children to engage in cultural learning experiences. Selected growths of tangled and cluttered kiawe, milo and Christmas berry tree in the beach area will be trimmed and removed to open more land for better use. Pathways will be cleared to provide access to the surrounding areas. In obtaining cultural experiences, the children will be participating in the restoration and restocking of the shrimp and fish ponds near the campground (the ponds are completely drained) and the preservation and protection of significant archaeological sites. Hawaiian history and culture will be taught and research will be conducted on the restoration and preservation projects as they are being implemented. It is planned that the children will be given school credits for their experiences in the program.

Other improvements to be made in the campground involve the construction of tent platforms and rock fireplaces. The tent platforms, which will be no more than one to two feet high, will be built of rock

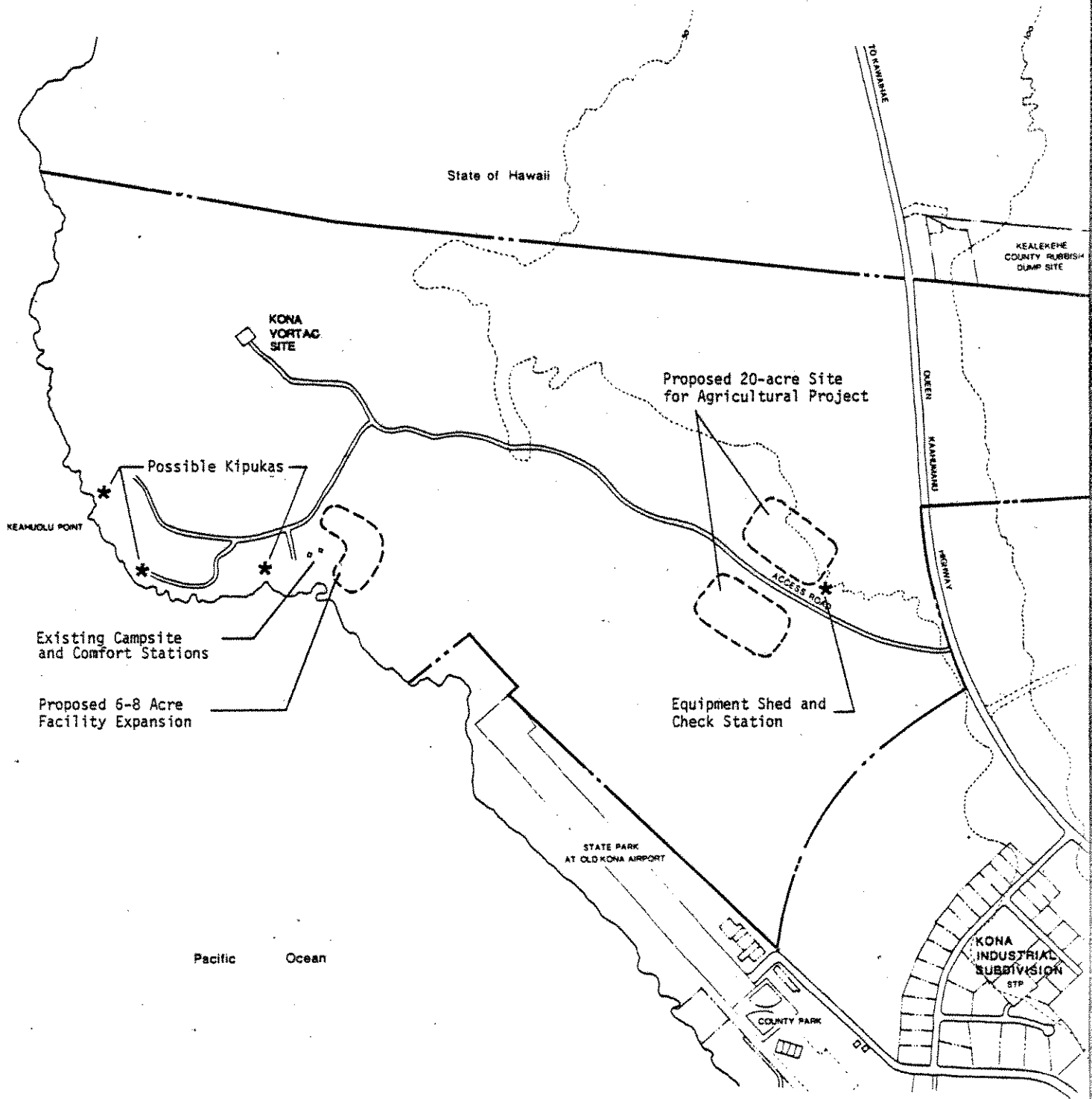
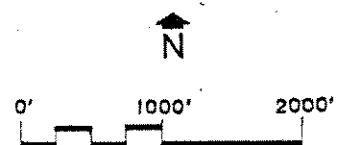


FIGURE 2

DEVELOPMENT PLAN

LILIUOKALANI TRUST - KEAHUOLU LAND
NORTH KONA, HAWAII

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and filled with sand. These site features would make the erection of tents and sleeping on the ground easier and more comfortable than on lava rock. Permanent fireplaces will also be constructed to confine cooking and fire to specific locations. The construction of the fire places and the tent platforms will be of materials found on the site.

Three small depressed sites or kipukas along the shoreline will be converted to camping spots. These sites which will be supplementary camping areas are smaller than the existing campground. The waterline that currently serves the Pawai campground will be extended to the new sites to provide water for drinking and washing as well as irrigation of plants.

In addition to the proposed improvements at the existing campsite, six to eight acres of adjacent land will be developed for recreational and cultural programs. To be constructed are: 1) up to three thatched-roof shelters known as halaus, in which classes in native arts and crafts will be conducted; 2) play areas for outdoor games; and, 3) a shed for administrative operations and storage functions. The grounds of the halaus will be landscaped with grass, shrubs and trees, and the play areas will be covered with topsoil and planted with grass. The single-level halaus will be opened-wall structures constructed of native materials.

The agricultural project, which will be developed on 20 acres of aa lava land near the center of the property and on both sides of the access road is intended to provide a two-fold benefit to the participants. One, it would provide instructions and develop skills in agriculture; and two, it would develop self-motivational attitudes among the participants with a focus on developing a positive feeling toward work and achievement.

Possible crops for the project, which have been experimented on lava land in other areas of the island, include plumeria, crown flower

and papaya. The agricultural operation will be facilitated with an equipment shed and an irrigation system. A check station for the entire Keahuolu project will be built as part of the equipment shed. The source of water for the agricultural operation is expected to come from the completed Kahaluu shaft above Keauhou if suitable water cannot be pumped from beneath the property. The well, if it were to be developed, would likely be within the property near the agriculture field.

A minimum staff of three will be administering the programs at the Keahuolu facility. The staff members will have experience in teaching and social work and will be participating in all aspects of the program.

Statement of Objective

The project is being developed for the purpose of providing educational, cultural and recreational programs for the beneficiaries of Liliuokalani Trust. These beneficiaries are children of Hawaiian ancestry who have been included in the Deed of Trust of the late Queen Liliuokalani.

The objective of the Trust is to provide "benefits to orphans and other destitute children in the Hawaiian Islands." A non-profit organization known as the Queen Liliuokalani Children's Center was created by the Trust to develop and manage programs and facilities for these children. So far, it has organized programs and established facilities on the Islands of Oahu, Hawaii, and Molokai.

Research by the Children's Center has indicated a high proportion of children of Hawaiian ancestry and a strong need in the Kona/Kohala area for the programs the Children's Center offers. Although the Children's Center has a Hilo office, its programs have not been made available to the Kona/Kohala area because of the distance from the region.

In 1974, the Trust set aside 935 acres of its land in Keahuolu for use by the Children's Center. Previously, this property had been in the investment portfolio of the Liliuokalani Trust. However, it has been

determined that the needs of the beneficiaries would be served best if these lands were opened for the children's specific use at this time.

In a definitive goal adopted by the Liliuokalani Trust in 1976, direction was established for the Children's Center "to assist needy children, with preference to aboriginal Hawaiian and Part-Hawaiian children," with programs for the beneficiaries "to achieve and maintain personal independence, self-determination and security in the home and community, within their cultural heritage, and to maximize potential of daily living."

The proposed development at Keahuolu is designed to provide facilities and programs that would work toward that goal. Activities would be constantly organized to provide varied camping experiences, lessons in Hawaiiana, exploration trips of historic sites, and practices of old Hawaiian methods of survival. These activities are intended to bring the youths in tune with the outdoors and with their natural heritage. Classes in the Hawaiian arts and crafts would enhance the children's awareness of their own culture as well as teach them artistic skills. Agricultural skills will also be taught as part of the agricultural project. Occasionally, parents will be brought along with their children for participation in the programs. There are family sharing experiences and group outings which are all part of the activities being planned at the Keahuolu facility.

The camping experiences, Hawaiian arts and crafts classes, agricultural project, and family outings are part of the program's objective to help improve and promote a relationship of respect and common bond between the youngsters and their elders and to strengthen the concept of family unity. Further, the Keahuolu staff intends to establish a sense of self-worth in the individual and to assist him in finding his place in modern society. The outdoor setting and the nature of the classes provide a more casual and less structured atmosphere for learning and for relating to one another than in the formal classrooms at public schools. These classes are not intended to be substitutes for the public schools but to supplement and expand on their programs.

DESCRIPTION OF THE SITE AND ITS NATURAL ENVIRONMENT

Existing Land Use

The 935-acre project site is in limited use. A graded road from the Queen Kaahumanu Highway provides access into the property leading to the existing 2-acre camp site which is available for outdoor camping by the beneficiaries of the Liliuokalani Trust. On the shoreline makai of the camp site is a small sandy beach cove where swimming, wading, snorkeling, and beachcombing are engaged. At the campsite is a pair of comfort stations which is located 300 feet from the shoreline and served by a 2-1/2-inch water line following the access road to the highway (see Figure 3). Sewage from the comfort station is collected by an on-site cesspool.

On a 0.17-acre parcel within the property is the Federal Aviation Agency VORTAC station, a ground navigational facility for aircrafts. The station is located 0.5 miles mauka of the shoreline between the existing camp site and the northwest property line. Access to the facility, which is still in operation, is via a road extending from the campsite access road. The road from the highway is, in fact, for the benefit of the VORTAC station but the Trust has rights to its use.

The lands around the property are also largely vacant and undeveloped. Located on the outskirts of the resort village of Kailua (population of 365, 1970 U.S. Census), the property is in an area where development has virtually not yet occurred. Further, the main direction of growth has been toward Keauhou-Kona where another resort area is being developed. The Kona Industrial Subdivision which represents the north edge of development in Kailua is on the east boundary of the project site.

The old Kona Airport which was in operation until 1970 abuts the property's south boundary. This facility has been replaced by the new Ke-ahole Airport, located approximately six miles northwest of the

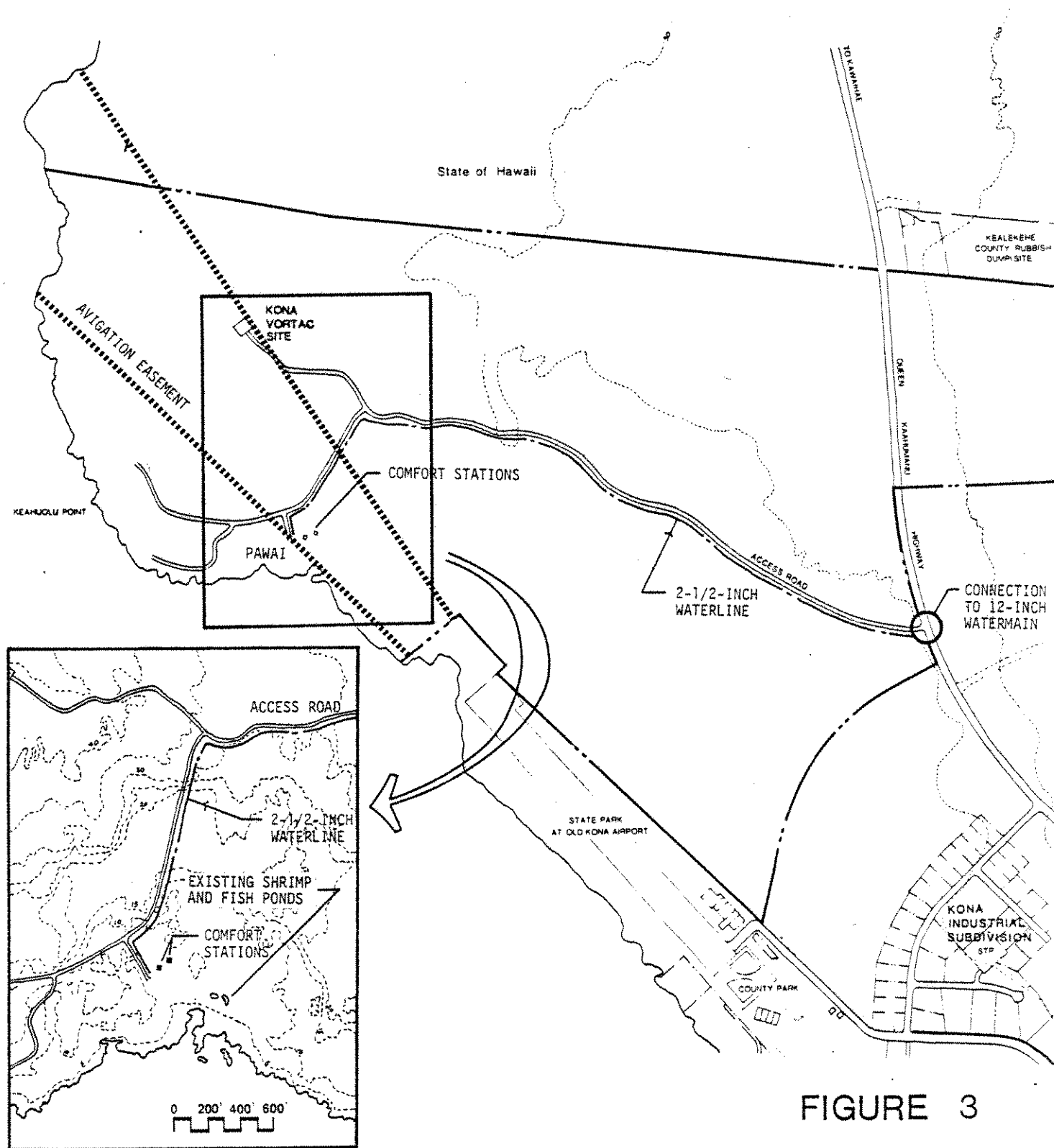


FIGURE 3

EXISTING LAND USE

LILIUOKALANI TRUST - KEAHUOLU LAND
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project site. The abandoned airport site is now being planned for a State park. In addition, a portion of the park site has been leased to the County which is currently developing its own park facility. Meanwhile, the airfield's aviation easement, which extends over the Liliuokalani Trust property, has not been cancelled. The easement which was created by Executive Order 1684, is, therefore, technically still in effect (see Figure 3). The State Department of Land and Natural Resources, which is doing the planning for the abandoned airport site, is expected to remove the easement when the programming and improvements to the new park are completed.

Physiography/Soils

The terrain is relatively level with elevations ranging from zero at the shoreline to 75 feet at the highway, a depth of 6,000 feet. Above the highway, the land continues to be relatively level past the property's mauka boundary which is located approximately at the 150-foot elevation.

The site is covered with an old pahoehoe lava flow which has not yet fully decomposed into soil. Aa lava is also found on the site particularly in the mauka area below the highway on both sides of the access road. As a result of the nature of the ground material and the relative dryness of the area, no definite surface drainage channels have been established.

Approximately half of the property's makai boundary is on the shoreline. This 7,500-foot shoreline boundary is virtually all rocky and typical of the Kona coast. Immediately inland and parallel with the coast are several long strips of sand areas which were most likely deposited by heavy storms in the past. The sand has created artificial sand beaches behind the rocky coast and provided spots for shoreline recreational uses.

Natural Hazards

The potential extent of tsunami inundation on the property is relatively small. From data of tsunamis which have hit the Island of Hawaii from 1946 to 1960, the largest inundation recorded during that time was 11 feet which is the elevation reached by the runup. It should be noted, the 1946 tsunami has been considered the most severe and most detailed recorded. Inundation on the site by that tsunami reached eight feet which measures a runup of 200-700 feet from the shoreline in the Pawai area.

Runups along West Hawaii have generally been less than along other parts of the island's coastline. The reason is believed that West Hawaii is on the protected side of the island from which the major tsunamis come.

Tsunamis generated from points west such as in the Philippines or in Japan are believed to have smaller effects because of the distance the wave must travel. Further, tsunamis generated by off-shore earthquakes at some point west of Hawaii have been considered rare and exceptional. A tsunami detection device has recently been installed by the National Weather Service to measure the occurrence of tsunami on the site.

Seismic activity in the Kona area is relatively common, but most of these quakes are small and do little or no damage. In 1951, one of the largest recorded quakes in West Hawaii occurred. It had a magnitude of 6.5 (on the Richter scale) and did damages in Kailua and in the surrounding communities.

Flora

Vegetation is sparse and limited mostly to natural growths of kiawe, Christmas berry, noni, koa haole, and wild fountain grass. Near the shoreline are scattered clusters of beach naupaka, kiawe and miLo tree. No exotic or rare plants are known to exist in the area.

Fauna

The property is noticeably absent of wild mammals except for the smaller ground species such as mongoose, rat and mouse. Birdlife is restricted to those traversing the site or straying from the nearby village of Kailua. Most of these are urban birds of the sparrow and dove variety. Shore fish, sea urchin, brittle star, sea cucumber and coral are found in the tidal pools, off the rocky shoreline and in the small coves which line the property's sea boundary. The recreation activities planned by the children's camp will not involve alteration or destruction of any of these natural habitats along the coastline.

Climate

The climate is generally mild with a mean annual temperature of 75 degrees. Rainfall averages 25 inches a year with no apparent wet or dry season. Winds are generally light to moderate and come predominantly from the southwest as a result of seabreezes and Kona storms. Almost 25 percent of the time, the winds are calm.

TECHNICAL/LEGAL

Government Policies

Zoning:

The following is the zoning and land use designation for the property. Note that the parcel has two designations under each State and County zoning and land use law. The boundary separating the two districts under County laws (see Figure 4) follows the boundary of the districts established under the State law (see Figure 5).

State Land Use District - Conservation	695 acres
- Agriculture	240 acres

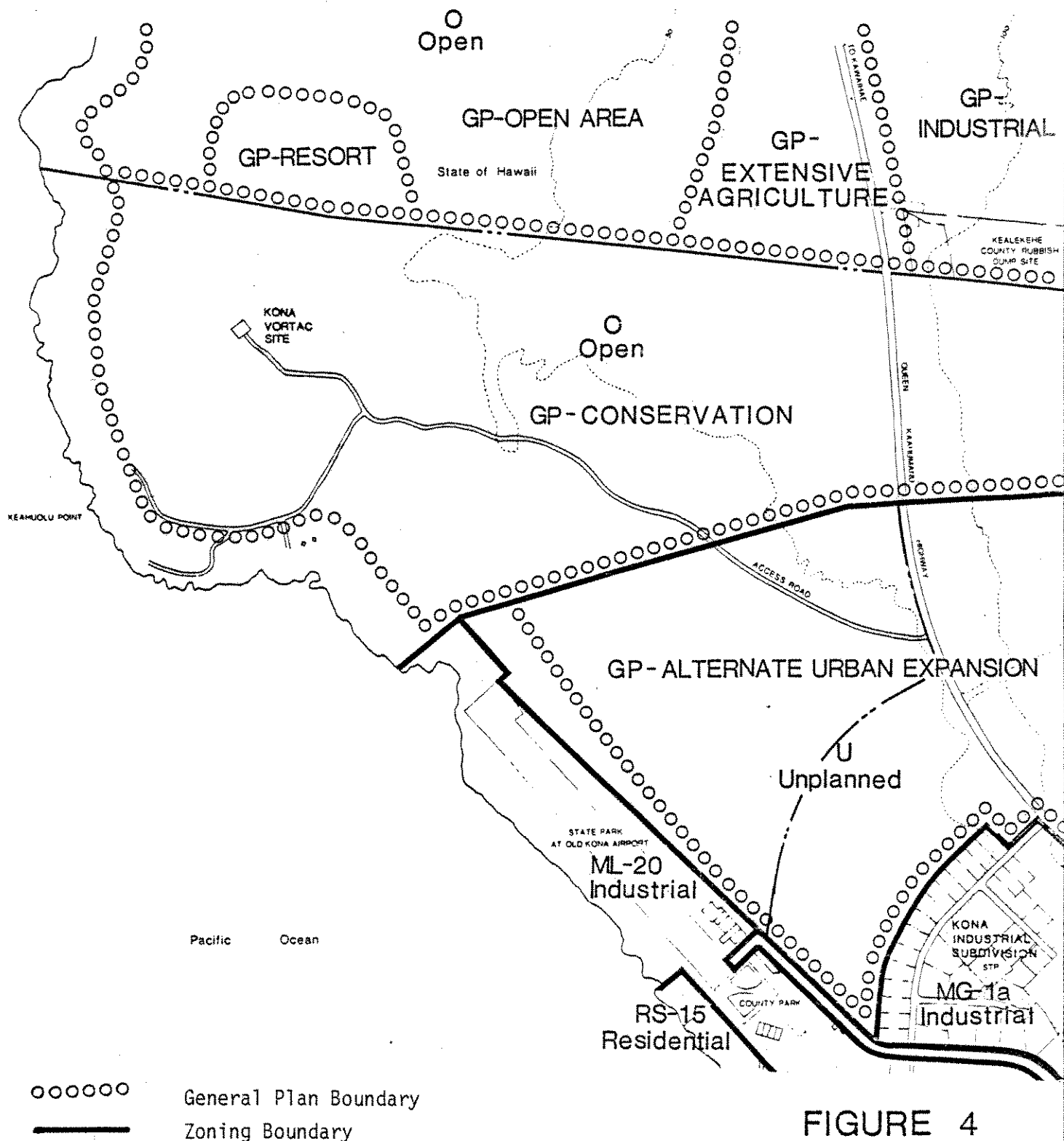


FIGURE 4

COUNTY GENERAL PLAN & ZONING

LILIUOKALANI TRUST - KEAHUOLU LAND
NORTH KONA, HAWAII

NOV. 1978

County General Plan - Conservation and Open Area 700± acres
- Alternate Urban Expansion 200± acres

County Zoning - Open 695 acres
- Unplanned 240 acres

Development and use of the Keahuolu property will require a Conservation District Use Permit regardless of whether only a portion of the property is in the Conservation District or whether the development is in only a small portion of the property. The portion of the property zoned Conservation by the State is further subzoned into "Resource" and "General" (see Figure 5). These subzones are broken up into the following acreages: Resource ±220 acres and General ±475 acres.

The objective of the Resource Subzone is "to develop, with proper management, areas to insure sustained use of the natural resources of those areas." The proposed recreation and camp activities are permitted uses which would not be destructive or detrimental to the surrounding environment. As part of the cultural and educational program at the Keahuolu facility, the children will be taught to respect the land and understand the meaning of life and its significance to the eco-system.

The General Subzone has been established "to designate open space where specific conservation uses may not be defined, but where urban use would be premature." These designated areas include lands suitable for farm use which is adaptable to the plans the Children's Center has for the area. Though the soil has a Land Study Bureau's Master Productivity Rating of E, which is poor for agriculture, the Children's Center is interested in an agricultural project that would begin first, in finding a suitable crop for an originally lava land and then develop skills for the children in agriculture and teach them the concept of work and self-achievement which are the primary purpose of the project. Only a small portion of the agriculture project will fall within the Conservation District; the remaining area will be within the Agriculture District.

Special Management Area:

The Special Management Area boundary follows the Queen Kaahumanu Highway, consequently the entire makai portion of the property is within the SMA (see Figure 6). According to the regulations, an SMA use permit will be required for any proposed use of the land. Further, under the Shoreline Setback Law of 1970, a shoreline setback of up to 40 feet, in which development is restricted, has been established along the property's 7,500-foot coastline. Both the SMA and the setback law are administered by the County.

Historic Sites:

An archaeological reconnaissance of the portion of the site below the highway has recently been conducted by Archaeological Research Center Hawaii, Inc. (see Figure 7 and Appendix). Many sites have been located and identified, particularly along the shoreline where remnants of an old fishing settlement have been found. There are 17 sites that have been located which are being recommended for further archaeological work should development occur over these sites. The remaining archaeological finds would be salvaged or recorded in the field. The Children's Center will take action to protect and preserve the sites recommended for preservation by the archaeological studies done for the site and by the Office of Historic Preservation of the State Department of Land and Natural Resources which already has two historic sites recorded for the property. A valuable part of the program at the Keahuolu facility includes the study of historic sites and artifacts which would give the children an appreciation of their natural heritage.

Construction of Proposed Action

The total cost of the proposed development is \$425,800. Below are the construction schedule and development costs of the proposed improvements.

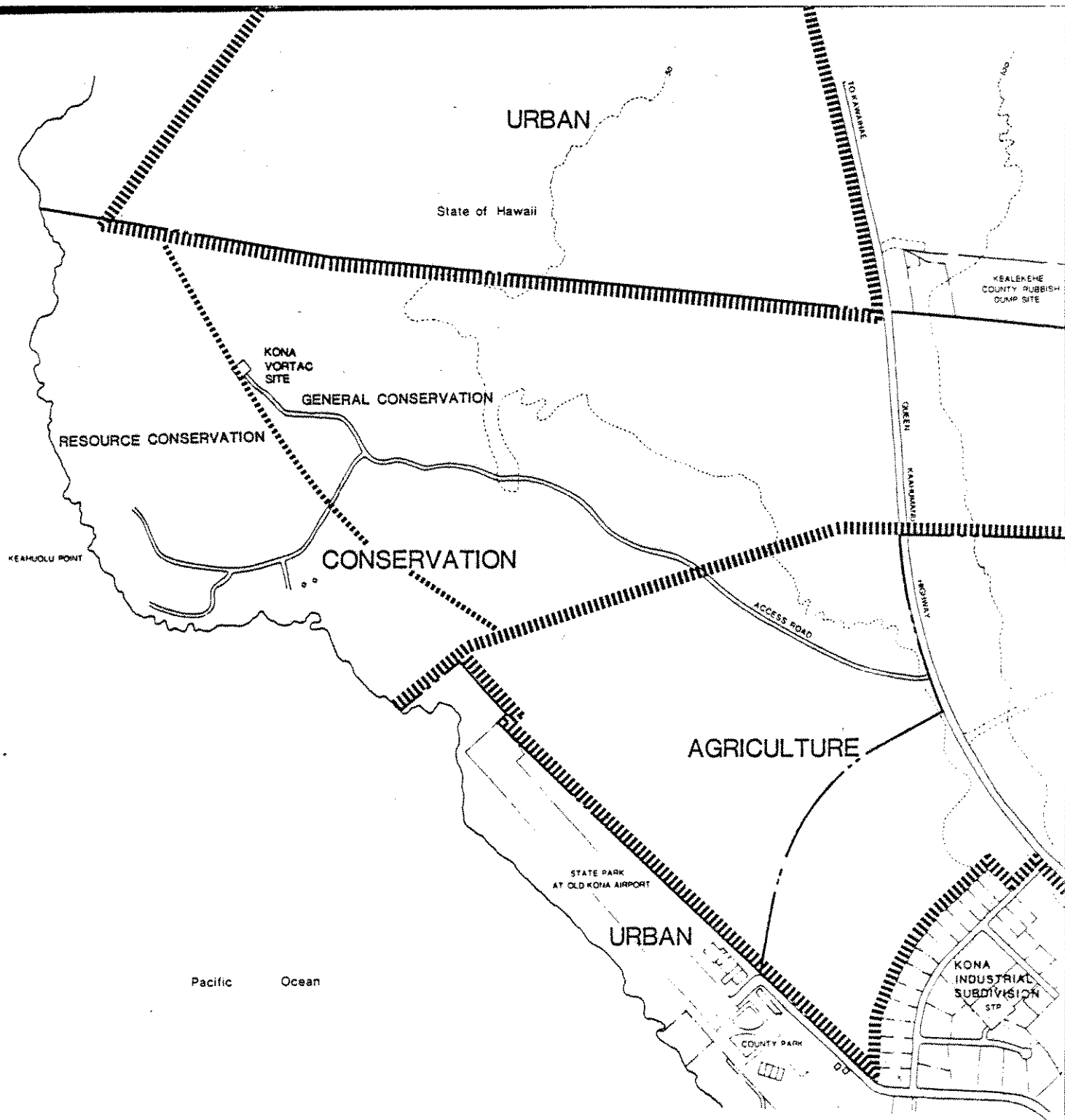
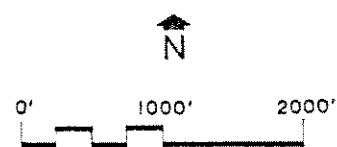


FIGURE 5

STATE LAND USE

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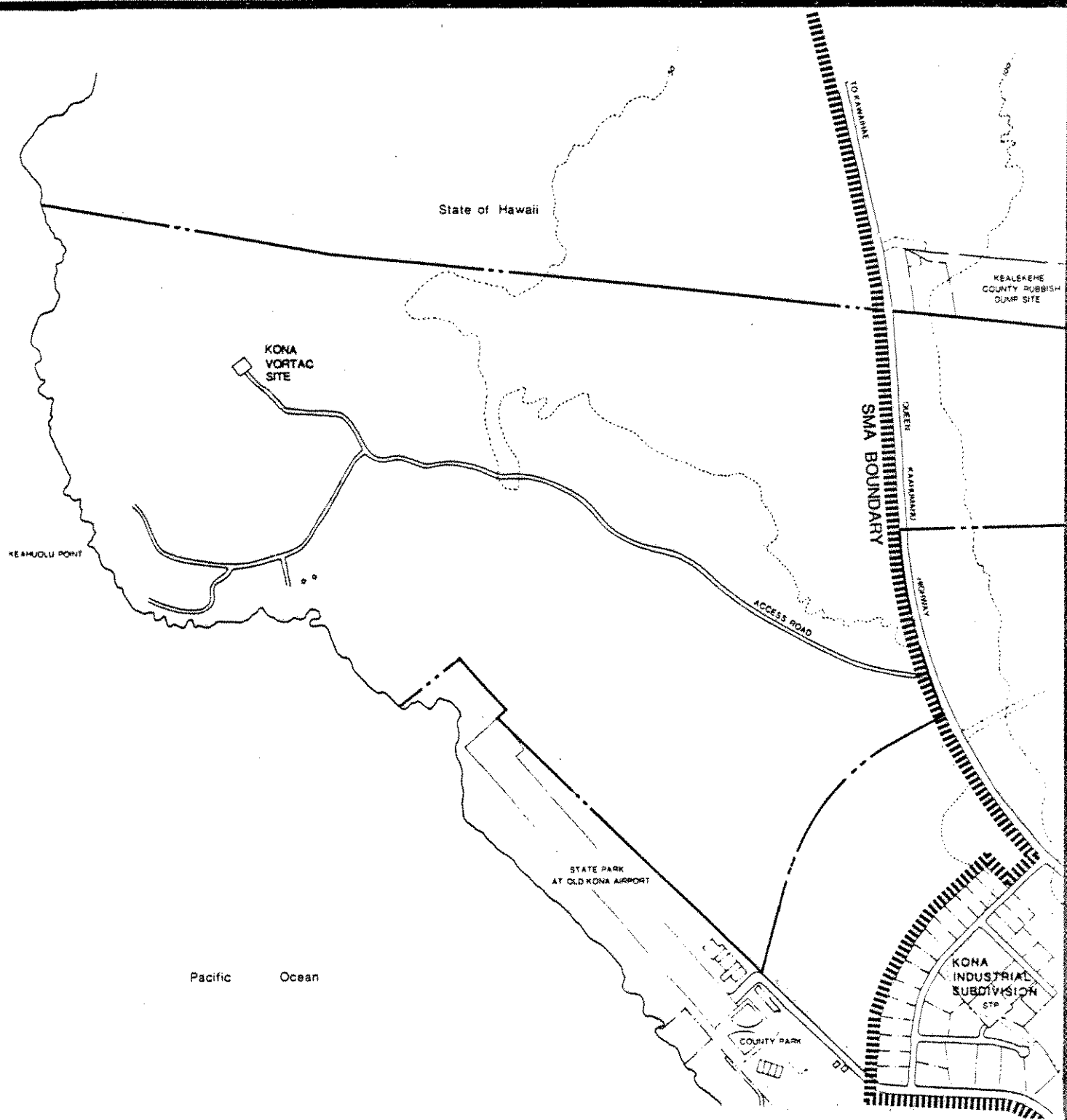
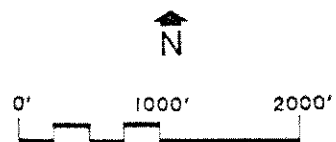


FIGURE 6

SPECIAL MANAGEMENT AREA

LILIUOKALANI TRUST - KEAHUOLU LAND
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ARCHAEOLOGICAL SITES

Ahupua'a of Ke'ahuolu
District of North Kona

LILIUOKALANI TRUST ESTATES

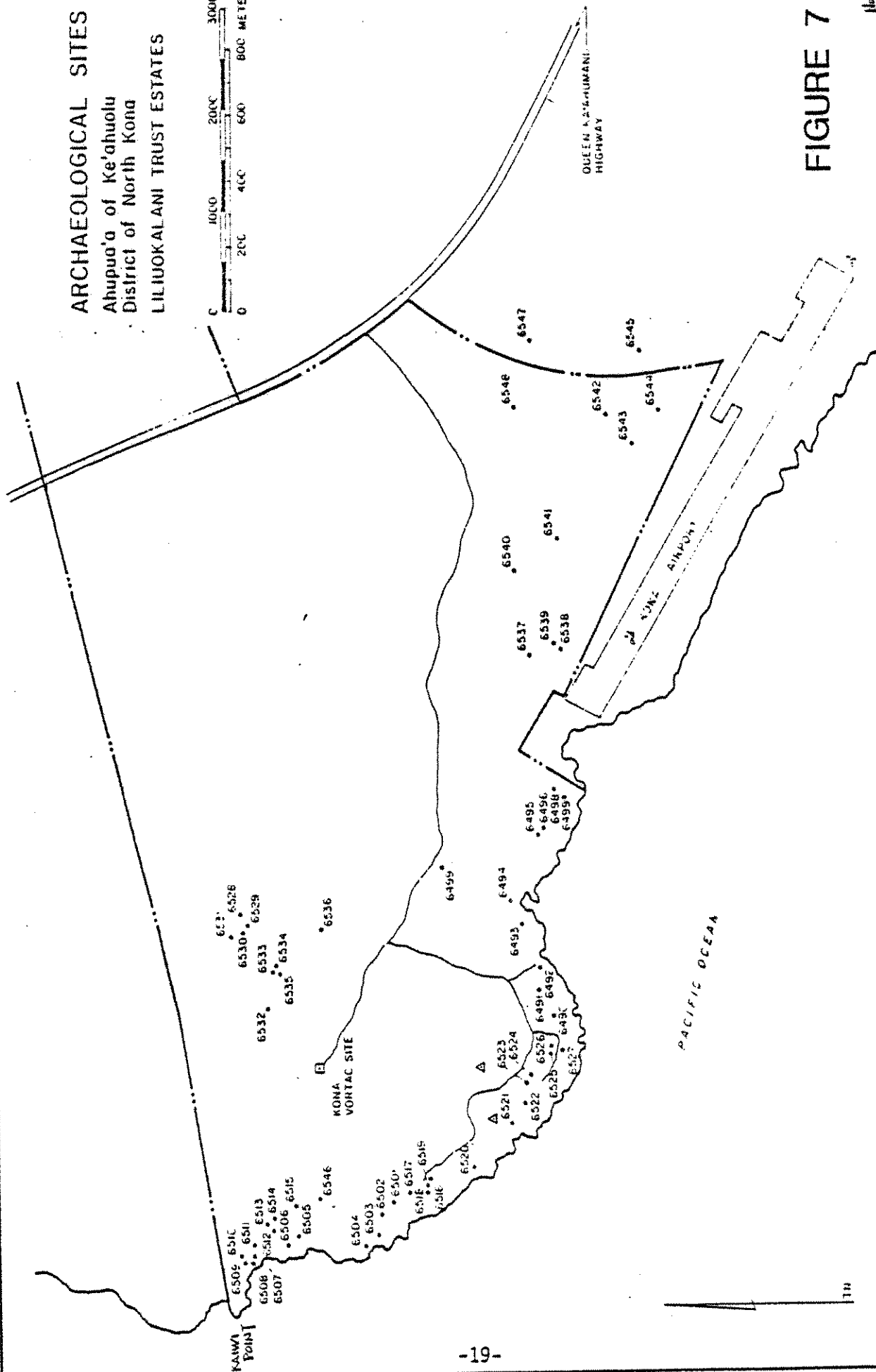


FIGURE 7

November 1976
14-139

CONSTRUCTION SCHEDULE AND DEVELOPMENT COSTS
FOR THE CHILDREN'S FACILITY AT KEAHUOLU

<u>IMPROVEMENTS</u>	<u>PLANNED YEAR OF EXPENDITURE</u>					<u>TOTAL PLANNED EXPEN- DITURES</u>
	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	
CAMPSITE IMPROVEMENT	\$ 21,600	\$ 5,100	\$ 1,000	\$	\$	\$ 27,700
ADDITIONAL CAMPSITES (kipukas)					3,500	3,500
ADJACENT AREAS IMPROVEMENT	52,000	91,000	37,000	37,000		217,000
AGRICULTURAL PROJECT	<u>47,600</u>	<u>70,000</u>	<u> </u>	<u>60,000</u>	<u> </u>	<u>177,600</u>
TOTAL PLANNED EXPENDITURES BY YEARS	\$121,200	\$166,100	\$38,000	\$97,000	\$3,500	\$425,800

Construction of the proposed improvements is part of a master plan that would span over a 5-year period. Therefore, it is requested that the Department of Land and Natural Resources takes this into consideration when reviewing the project's construction timetable in regard to Section 6, A-15 of Regulation 4, which specifies a time limit for plan implementation.

Approximately, one-half of the project cost will be for site preparation, especially for leveling and grading of the lava rock, filling with topsoil and landscaping. Use of heavy equipments such as a bulldozer, grader, backhoe, dump truck, pick-up truck, compactor, flatbed truck, van, and portable cement mixer during the construction period would generate noise but would not pose any significant adverse impact on nearby residential or hotel facilities, especially when no blasting is involved. King Kamehameha Hotel, the nearest of these facilities, is over one mile from the proposed Keahuolu development.

There would be some adverse visual impact when construction reaches the grading stage. Vehicles traveling on Queen Kaahumanu Highway, park users and beach goers at the old Kona Airport and people at the Honokohau Small Boat Harbor would be able to see dust generated by the bulldozer grading the site. Although this is a long-term project, grading would occur only in short periods of not more than one week at a time for each proposed improvement. Further, the direction in which the dust would be blown by the predominant winds is inland toward the northeast where only vacant and undeveloped lands exist. Moreover, the area of construction is over 1,000 feet from Queen Kaahumanu Highway, therefore it is expected that the dust would have settled by the time it reaches the highway, especially when the area is known to have relatively mild or calm winds.

The increase in traffic on the road systems around Kailua would not be noticeable as a result of construction vehicles going to and from the site. Except for the importation of topsoil which will be required for the campsite expansion area and the agriculture project, construction on the site will involve mostly site preparation and not extensive structural construction which normally involves heavy material importation.

Erosion presents no significant impact to the area because of the relatively level nature of the site, rockiness of the ground material and dryness of the area. Sedimentation into the ocean, therefore, does not constitute an environmental problem during the project's site preparation stage.

SOCIO-ECONOMIC

Population and Settlement

The population of North Kona has doubled in the past 26 years to an estimated total of 7,200 persons in 1976. Most of this growth have occurred in the last six years (a gain of approximately 49 percent) primarily as a result of hotels opening in Keauhou and condominiums

opening in the area between Kailua and Keauhou. Moreover in Kailua, shopping complexes, restaurants and other tourist-related facilities have recently been developed furthering the growth of resort activities in the region.

The addition of these new facilities and the development of complementary facilities such as rental car agencies, restaurants, and tour operations have stirred employment and stimulated in-migration to the region resulting in an accelerated rather than a gradual growth through natural population increase.

The region's residential settlements are located predominantly in the mauka area a mile or two above the resorts. Most of these communities are expansion of the old settlements which are strung along the Mamalahoa Highway circling the island. Residential homes have also been developed between the two coastal resorts, however, they are mostly condominium units which are more of investment properties and second homes than are primary owner-occupant homes.

Although recent construction activities have been predominately in resort facilities, Kailua has also experienced development in light industrial use. Industrial lots and businesses have already opened immediately west of the town center adjacent to the Keahuolu property. The direction of urban growth, however, will not be in this direction. According to current County policies, expansion of Kailua is being programmed toward Keauhou.

Employment

The largest employer in North Kona is the service-related industries. Approximately 60 percent of the jobs are in hotels as well as in real estate, recreation and amusement facilities, repair services, personal services, and professional services. This figure supports the fact that tourism in Kona is a major industry. It is further evidenced by the number of hotels and shopping complexes that has been built in Kailua and Keauhou.

Approximately 3,500 hotel rooms have been developed in the North Kona area which represent roughly 60 percent of the total visitor accommodations on the island (includes condominium units available for tourist rental). Over the past 10 years (1968 to 1977) the number of rooms in North Kona has tripled. This growth rate has exceeded Hilo and has left the Kohala area far behind in assuming the role of the destination area for West Hawaii. However, this growth has hit a temporary snag as with the rest of the island where the increase in the number of rooms has stabilized, particularly in the last two years. It is apparent that this condition is improving as the number of visitors to Hawaii, through the first nine months of this year, is showing a strong gain (7.4 percent over the same period last year) and the average occupancy rate is increasing (8.2 percent over the same period last year).

Retail trade is the second largest employer in the region representing 20 percent of the area's employment. This was expected considering the complimentary nature of the industry to the tourist business. Federal, State and local government represent 9 percent of the employment and the remaining industries on an individual basis represent 3 percent or less including agriculture which is less than 1 percent.

The extent of employment in the industries at the island level is generally the same with service and retail trade also being the lead industries.

The unemployment situation on the Big Island seems to be improving as the unemployment rate has been dropping for the past two years from a peak of 11.4 percent in 1976 to the current rate of 8.7 percent (for the first seven months of this year), the lowest in five years.

The impact of employment at the Keahuolu facility is expected to be negligible. There will be a minimum of three staff workers administering the programs. Maintenance of the area will be taken care of, to a large extent, by the camp participants. This would include, basically, the keeping of the grounds clean and the clearing of a few areas overgrown with wild vegetation.

The agriculture project will not be hiring in the job market. The program will be operated wholly by the camp staff and the children. The purpose of the program is to teach the youths basic skills in agriculture and to establish the concept of work in the individual.

During the planning and construction period, there will be work in the design profession and the construction industry, materials will be on order, and salaries will be paid and spent, probably all on the Big Island. But, because of the minor size of the development and the small number of contract labor and construction material involved, the impact on the local economy will be minimal and extremely limited.

Public Roads

Abutting the mauka boundary of the project site is the Queen Kaahumanu Highway, a high-speed State facility connecting Kailua and Kawaihae while providing access to the coastal areas in North Kona and South Kohala. The portion of the highway abutting the property, however, is under the jurisdiction of the County. The maximum capacity of the two-lane highway is 2,000 vehicles per hour. This is well over the present traffic load. The total vehicles traveling on Queen Kaahumanu Highway between Kailua and the airport is 3,536 in a 24-hour period (compiled in March 1976). Further, the peak load which represents the afternoon rush hour is only 321 vehicles. The portion of the highway which abuts the property is used primarily to transfer people and goods between the airport and Kailua village. Use of the highway also involves travel from Kailua to the small boat harbor at Honokohau and to the South Kohala area.

Vehicles turning into the property from the Highway will impede the flow of traffic somewhat, but the fact is, the number of vehicles making the turns will be extremely small. The camping activities planned at the project site are two-, three- or more-day experiences involving overnight stay. These activities may occur during the summer, once a month, or only over weekends.

The cultural/educational program which would involve children coming to the site more frequently, perhaps as often as everyday from the public schools, would most likely arrive by van, thereby reducing the number of vehicles coming to the property. In the initial phase of the program which includes the maintenance, restoration and preservation projects at Pawai, only one or two vans would be coming to the campground from the public schools each day.

Utilities

Water is available to the site via a 12-inch line along Queen Kaahumanu Highway. Connecting the system to the comfort station at Pawai is a 2-1/2-inch line which lies above ground along the campsite access road.

The source of the water is the Kahaluu wells located above Keauhou at the 800-foot elevation. Expansion of the source through construction of a new shaft is scheduled to be completed in April of 1979. This new addition by the State would double the maximum daily use of water in the Kona area to as far as the Ke-ahole Airport. Completion of the Kahaluu Shaft would coincide with the commencement of the Keahuolu programs particularly those which would require additional water.

No public sewer system serves the site. Sewage from the existing comfort station is collected by a cesspool. Electricity service is available from power lines which follow the access road to the VORTAC site. Telephone service is available from nearby developments.

Other Public Facilities

The residential communities and resorts of North Kona are served by public facilities which include one private and two public elementary schools, a public library and a fire station. In nearby Kealahou, in the South Kona District, there are a public intermediate and high school, a police station and a hospital to accommodate the area-wide needs.

Hawaii's improved road system has provided quick access and movement to many of the island's recreational areas. In West Hawaii, there are no less than 10 County parks, 4 State parks and 2 National parks. Many of the County parks are beach facilities while the two national parks are historic attractions. In addition to these park facilities, there is a recreational pier in Kailua Bay where sailing, fishing and other similar activities are staged. Supplementing Kailua Bay is a small boat harbor at Honokohau located only three miles northwest of Kailua. It is the principal mooring facility in the area and is currently undertaking expansion. The County has a public mass transit system operating daily in the Kona area, but its daily runs are still very limited.

The new Ke-ahole Airport, which has replaced the old Kona Airport, now serves as the principal airport for West Hawaii. Located eight miles northwest of Kailua, it provides daily scheduled flights for inter-island travel. General Lyman Field in Hilo provides daily scheduled inter-island flights to East Hawaii as well as catering to overseas flights from the West Coast. A deepwater harbor serving the West Hawaii area is located at Kawaihae approximately 35 miles from Kailua.

SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATING MEASURES

- o Development will occur on the site, however, the improvements will be made deep within the property and in the vicinity of the existing restrooms which are 300 feet from the shoreline, well beyond the 40-foot shoreline setback. Some clearing and clean-up will occur near and in the beach area, but these activities will involve trimming and removal of deadwood and debris and will involve restoration and preservation of significant historic sites.
- o Construction noise will be generated but will not be audible at the nearest residential or hotel/commercial activity, especially when

no blasting is involved. Some dust will occur, but the area of grading is deep in the property and the dust will have settled before reaching any public area. The rockiness and level condition of the site will minimize any problem of erosion or sedimentation into the ocean.

- o Development of the facility would not harm any rare flora or fauna nor destroy any significant historic/archaeological site.
- o There will be no significant burden on public facilities and services such as water, sewer, public roads, police, schools, fire stations, health facilities, public parks, power and telephone. Although, the proposed agriculture project would seem to be a water consuming activity, the Children's Center plans to utilize a drip irrigation system to conserve water. Furthermore, the project will not be in operation until the planned Kahaluu Shaft is completed. The use of the shaft as a source of water is, in fact, a secondary measure which would depend on whether water can be drawn from beneath the project site.

The children's activities planned at Keahuolu would generate only minimal traffic going to and from the site. During the construction period, traffic on the local road system would increase somewhat but only temporarily. Because construction on the site would involve mostly site preparation and not extensive structural construction, importation of building materials to the site would be relatively limited. For the agricultural project, the extent of material importation would involve approximately 2,500 cubic yards of topsoil to be brought to the site by two 20-yard dump trucks. They would each be making five round trips a day for approximately two to three weeks. These vehicles would be scheduled to run during the least heavy traffic hours.

- o Although the proposed development does not provide public beach access from Queen Kaahumanu Highway, ample parking and access are

available in the adjoining old Kona Airport site which is being converted to a public park. The entire shoreline of the Keahuolu property will be accessible to the public from the new State/County recreational facility.

- o The proposed use is compatible with the surrounding environment and is concurrent with County and State land use policies for the area.
- o Hiring of program staff would have only minimal effect on the job market and construction of the facility would have extremely limited primary and secondary effects on the economy.
- o The most significant impact of the proposed use would be the effect the children would have on society and the community. This effect is designed to be positive rather than negative as the program at Keahuolu is intended, among others, to teach the youths to acknowledge their self-worth, to relate to one another, to believe in the meaning of family unity, and to adopt a positive work attitude. The result would be an individual who could adapt himself to the community and make a contribution to society.

APPENDIX

Portion of Report
Prepared By
Archaeological Research Center Hawaii, Inc.
November 14, 1978

Fifty-nine (59) archaeological sites were discovered which included 140 separate features. Most of the features are concentrated along the coast. These features, including stone structures, have been badly damaged by high surf and tsunamis and, therefore, have little or no excavation potential. Small cave shelters distributed along the coast and slightly inland contain cultural deposits and have archaeological value for excavation and subsequent historic interpretation.

Generally, the inland portion of the project area is devoid of significant archaeological remains. The few scattered features are in poor condition and difficult to interpret. The single exception is site 6540 which consists of a cluster of occupation features including platforms, paved areas and cave shelters. This is the only site which includes surface features that have excavation potential.

On the basis of the nature and distribution of sites located in the project area, the following recommendations are made.

In absence of extensive impact of the project area no further archaeological work is recommended. If extensive modification is planned which will include subsurface modification of cave shelter sites, including sites 6409, 6491, 6495, 6501, 6502, 6503, 6504, 6505, 6509, 6513, 6515, 6517, 6522, 6526, 6544, 6547, and/or modification of the area of site 6540, then further archaeological work including test excavation should be carried out before these sites are impacted. In coastal sites there are a number of well preserved portable "salt pans". The finer examples of these should be collected and saved if their present location is threatened by development.

SUMMARY FEATURE COUNT

Cave shelters.	25
Enclosures	10
Boulder alingments	12
Walls.	1
<i>Ahu</i>	21
Salt pans.	29 +
Platforms.	8
Pavings.	21
C or U Shaped Structures	4
Wells.	2
Petroglyphs.	3
Planting or storage areas.	1
Basalt quarry.	1
Occupation area.	1

TABLE OF SITES PROJECT 14-139

Feature Numbers	Description
50-10-27 6490	Cave shelter; in high surf zone
50-10-27 6491	Complex of 4 cave shelters in a depression between 2 lava bubbles; depression (30 by 20 meters) contained dark, highly organic cultural deposit of charcoal, midden, coral; shelters may have been sleeping areas, one had a grass mat on floor.
50-10-27 6492	Square enclosure; approximately 4 meters across; core filled walls, 1 meter high (interior), 1.2 meters high (exterior); midden, coral, 'ili 'ili paving on floor; interior 40 to 50 centimeters above surrounding ground surface; no apparent entrance.
50-10-27 6493	Rectangular enclosure; 7 by 4 meters; in poor condition; walls of stacked boulders, 50 to 75 centimeters high; located on lava bubble behind LT campground - Boulder alignment; 3 by 2.5 meters; probably of recent construction; U-Shaped; 2 meters <i>mauka</i> of enclosure.
50-10-27 6494	Boulder retaining wall along brackish water pool at <i>mauka</i> end of LT campground; in <i>hau</i> thicket.
50-10-27 6495	Cave shelter; 3 meters across at entrance, 1 meter deep, .75 meters high; coral, soil, sand, midden of floor; open, level ground to west, fronting shelter.
50-10-27 6496	Collapsed lava tube; modern occupation; carpet strips, boots, old clothes, newspapers dated 1975 (National Enquirer)
50-10-27 6497	Enclosure; possible animal pen; 10 by 8 meters; walls of roughly stacked boulders, 70 centimeters high; interior filled with sand.
50-10-27 6498	Enclosure; remnant; midden, coral, metal fragments scattered in area; paving redeposited by wave action to inland side of structure.

Feature number		Description
50-10-27	6499	<i>ahu</i> ; 1 meter across, 50 centimeters high; <i>pahoehoe</i> slabs and cobbles; on lava bubble.
50-10-27	6500	Boulder alingment; with associated salt pan, possible habitation site.
50-10-27	6501	Habitation complex; paving with boulder curbing approximately 10 meters across, with pebbles, cobbles, scattered branch coral, midden; cave shelter in lava bubble, approximately 20 meters long, 4 to 5 meters wide, 75 centimeters high, partially walled across entrance, with sand floor (organic deposit beneath sand), midden historic debris; pebble fill in fissure along base of lava bubble; numerous salt pans in area.
50-10-27	6502	Cave shelter; partially walled across entrance; 6 meters long, 1 meter wide; with sand floor.
50-10-27	6503	Habitation complex; cave shelter in collapsed lava bubble, with midden; two salt pans, with windbreaks; enclosed paving, 6 by 4 meters, with cobbles and sand; boulder alignment forming rectangular outline on lava bubble, some pebble fill.
50-10-27	6504	U-Shaped structure of roughly stacked boulders; walls 20 to 40 centimeters high; in poor condition. Cave shelter; 3 meters long, 2 meters deep, 1 meter high; sand floor with branch coral, some midden; wall in poor condition fronting opening.
50-10-27	6505	Cave shelter; much midden, branch coral.
50-10-27	6506	Habitation complex; crude boulder alingment outline soil and midden deposit on lava bubble; about 5 meters long, 3 meters wide; salt pan to west of structure; cave shelter to northeast, sand floor with midden, 2 meters long, .75 meters deep, .75 meters high, rocks piled in front.
50-10-27	6507	3 boulder alignments forming circular outlines 2 meters across; on <i>pahoehoe</i> floor.
50-10-27	6508	Enclosure; coral paving; upright slabs in <i>makai</i> wall; cupboard in northeast corner wall.
50-10-27	6509	Cave shelter; wall fronting shelter forms 3 meter by 3 meter enclosed area; midden branch coral on surface.
50-10-27	6510	C-Shaped structure; midden scattered in surrounding area; on lava bubble.

Feature Number		Description
50-10-27	6511	<i>ahu</i>
50-10-27	6512	Boulder alingment; some midden; in poor condition.
50-10-27	6513	Well; in lava cave, boulder facing living access; 2 cave shelters, one on either side of well access; at higher level above water table; 2 salt pans in vicinity.
50-10-27	6514	<i>ahu</i> ; 50 centimeters high, 20 centimeters wide; possible modern construction.
50-10-27	6515	<i>ahu</i> ; 2 of possible modern construction.
50-10-27	6516	Enclosure built up against lava bubble; incorporates cave shelter; wall 75 centimeters high but in poor condition; 4 to 5 meters long, 2 meters wide.
50-10-27	6517	Complex of 5 cave shelters, one platform, 3 paved areas with boulder curbing; built on and around lava bubble; salt pans in vicinity.
50-10-27	6518	Enclosure, roughly constructed of stacked boulders, possibly 2 rooms; 2 boulder alingments forming U-shaped outlines; all on top of lava bubble; one salt pan.
50-10-27	6519	C-Shaped structure, built into side of <i>pañoehoe</i> bubble; opens to south; of roughly stacked boulders; midden.
50-10-27	6520	4 paved areas enclosed by boulder curbing; midden; nine salt pans in vicinity.
50-10-27	6521	U-Shaped structure; formed by 2 stacked boulder walls extending off of lava outcrop; rock mound on outcrop; structure opens to south.
50-10-27	6522	Cave shelter, with wall fronting opening; midden all around.
50-10-27	6523	6 paved areas with boulder curbing; 1 <i>ahu</i> ; salt pans in vicinity.
50-10-27	6524	Platform; of stacked boulders, possible monument burial, depression in center; coral in fill; in good condition.
50-10-27	6525	3 mounds.
50-10-27	6526	1 stone alignment with paving; cave shelter.
50-10-27	6527	paved area with boulder curbing.
50-10-27	6528	2 platforms on lava ridge; 1 is 3 meters long, 2.5 meters wide, 1 meter high, boulder facing with cobble fill; other is 2.60 meters long, 2 meters wide, 80 centimeters high, <i>pañoehoe</i> slab facing with cobble fill, lower than other platform; in good condition.

Feature number	Description
50-10-27 6529	3 platforms in poor condition; one has stone facing with cobble fill; other 2 are unfaced pavements.
50-10-27 6530	4 <i>ahu</i> , 50 centimeters high, 80 centimeters wide, surrounding a paved area, 2 meters wide, 2.5 meters long.
50-10-27 6531	<i>ahu</i> , collapsed.
50-10-27 6532	<i>ahu</i> , square, 1 meter on a side, 75 centimeters high, constructed of <i>pahoehoe</i> blocks with angular cobble fill; brance coral all around; adjacent crevice partially filled; possible burial (in crevice).
50-10-27 6533	Petroglyphs; male figure; letters probably spelling a name but too faint to decipher.
50-10-27 6534	2 <i>ahu</i> on <i>pahoehoe</i> flow, low possibly collapsed; crevices in surrounding area filled with <i>pahoehoe</i> slabs.
50-10-27 6535	<i>ahu</i> with 2 pieces of coral.
50-10-27 6536	enclosure built against lava outcrop; walls constructed of stacked <i>pahoehoe</i> slabs, 3 meters square, 50 centimeters high, outcrop is 1 meter high; 1 large peice of coral in wall.
50-10-27 6537	Boulder alignment on <i>pahoehoe</i> flow; 2 meters square; forms U-shaped outline opening west.
50-10-27 6538	Well; entrance to cave lined with boulders; interior modified with small platform and wall possible basalt quarry in vicinity.
50-10-27 6539	Planting or storage area; depression in <i>pahoehoe</i> flow, 50 centimeters across; soil floor; low boulder and cobble wall, 20 centimeters high, built around it.
50-10-27 6540	Occupation area in low ground among lava bubbles, 150 by 300 meters; includes several platforms of stacked boulders, paved areas, boulder alignment enclosing an 18 by 10 meter area, walls facings adjoining lava outcrops, cave shelters, <i>ahu</i> , a trail, and a large lava tube cave (car found inside) midden, historic debris; center of area is large lave bubble.
50-10-27 6541	Boulder alignrment forming circular outline, 2 meters in diameter; on lava.
50-10-27 6542	Enclosure of small <i>aa</i> boulders with cobble fill, interior paved in <i>aa</i> clinkers with some coral depression in center of enclosure; measures 4.5 meters long, 4 meters wide; walls 40 centimeters wide.

Feature number	Description
50-10-27 6543	Habitation complex; includes 1, 3 meter square enclosure of stacked <i>pahoehoe</i> blocks; boulder faced, pebble and cobble filled platform; 3 paved areas.
50-10-27 6544	Cave shelter with wall fronting overhang; 6 meters long, 2 meters deep, 1 meter high.
50-10-27 6545	<i>ahu</i> , 1.5 meters in diameter, 50 centimeters high.
50-10-27 6546	At least 5 salt pans on lava bluff.
50-10-27 6547	Cave shelter, 3 by 2 meters, with wall fronting opening.
50-10-27 6548	2 <i>ahu</i> of <i>pahoehoe</i> slabs.